CLAIM AMENDMENTS:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) An automated method of provisioning a virtual private network, the method comprising:

receiving a high level description of a topology of a network;

applying a set of rules to the topology of the network to produce a plurality of route targets stored in a memory and associated with virtual private networks to be assigned to the network;

grouping a set of route targets from the plurality of route targets with respect to each customer equipment node within the network to form a group of route target sets;

removing duplicate route target sets from the group of route target sets to form a reduced size of route target sets based on the route targets between duplicate route target sets being the same;

assigning each set of route targets in the reduced size set of route targets to a virtual routing and forwarding VRF element and all the CEs with the same RT set on one PE share one VRF; and

generating an output file including output data that identifies each of the VRFs and the associated route targets assigned to each of the VRFs;

wherein the memory includes a virtual routing and forwarding (VRF) element to route target data mapping for each of a plurality of provider edge routers (PEs) and wherein all of the customer edge routers (CEs) with the same route target (RT) set on one PE share one VRF.

2. (Original) The method of claim 1, further comprising communicating the output data to a network element within the network.

3. (Original) The method of claim 1, further comprising communicating the output file to a system having a display.

4. (Previously presented) The method of claim 1, further comprising displaying a report based on the output data.

5. (Original) The method of claim 1, wherein the high level description of the topology of the network comprises a plurality of data entries, a first set of the data entries identifying customer edge (CE) routers, a second set of data entries identifying provider edge routers corresponding to each of the customer edge routers, a third set of the data entries identifying a topology type for each of the virtual private networks.

6. (Original) The method of claim 5, wherein the network element is a VRF component within a data router and wherein the topology type is selected from full mesh, central service and hub and spoke topology types.

7. (Original) The method of claim 5, wherein the network is a multi protocol label switching (MPLS) network and wherein the plurality of data entries has a table format wherein the rows are virtual private networks, a set of columns are defined by the customer edge routers and the table entries include the associated provider edge routes.

8. (Previously presented) A computer network operations system comprising:

a terminal having a display portion;

a data input device to receive input from a user;

a computer system having a memory and a processor, the computer system coupled to the terminal and to the data input device;

wherein the display portion of the terminal provides an input screen having a data format configured to prompt the user to provide high-level network topology data via the data input device, the high-level network topology data including virtual private network information with respect to a backbone data network;

wherein the computer system converts the high-level network topology data into a set of route targets to be assigned to virtual routing and forwarding elements, the set of route targets stored in the memory, wherein the memory includes a virtual routing and forwarding (VRF) element to route target data mapping for each of a plurality of provider edge routers (PEs) and wherein all of the customer edge routers (CEs) with the same route target (RT) set on one PE share one VRF.

9. (Original) The computer network operations system of claim 8, wherein the backbone data network comprises a multi protocol label switching (MPLS) network.

10. (Currently amended) A method of provisioning a virtual private network service, the method comprising:

providing a set of rules regarding assignment of route targets stored in a memory for each of a plurality of virtual private networks;

configuring provider edge routers (PEs) of a backbone network;

configuring customer edge routers (CEs), each of the customer edge routers having a relationship link to at least one of the provider edge routers;

assigning route targets to each of the customer edge routers based on topology requirements of the backbone network and based on the set of rules, wherein route targets are grouped into sets and duplicate sets of route targets are removed based on the route targets between duplicate sets of route targets being the same; and

configuring each of the VRFs and RTs on the corresponding provider edge routers to form a logical topology;

wherein the memory further includes a virtual routing and forwarding (VRF) element to route target data mapping for each of a plurality of provider edge routers (PEs) and wherein all of the customer edge routers (CEs) with the same route target (RT) set on one PE share one VRF.

11. (Original) The method of claim 10, further comprising adding an additional CE to one of the plurality of virtual private networks to form a modified logical topology.

12. (Original) The method of claim 10, further comprising deleting one of the CEs of one of the plurality of virtual private networks to form a modified logical topology.

13. (Original) The method of claim 11, wherein the modified logical topology has a new VPN with respect to the logical topology.

14. (Original) The method of claim 12, wherein the modified logical topology has a removed VPN with respect to the logical topology.

15. (Original) The method of claim 10, further comprising communicating the logical topology to a remote computer system wherein the logical topology includes a modified topology type, the modified topology type changed from Hub and Spoke to a full mesh arrangement.

16. (Original) The method of claim 15, further comprising displaying a graphical representation of the logical topology to a user of a terminal coupled to the computer system.

17. (Original) The method of claim 16, wherein the terminal is an operations terminal of a network management system, the network management system tied to the backbone network.

18. (Original) The method of claim 10, wherein the high level description of the topology of the network comprises a plurality of data entries, a first set of the data entries

identifying CEs, a second set of data entries identifying PEs corresponding to each of the CEs, a third set of the data entries identifying a topology type for each of the virtual private networks.

19. (Original) The method of claim 10, wherein the network element is a VRF component within a data router and wherein the topology type is selected from full mesh, central service and hub and spoke topology types.

20. (Original) The method of claim 10, wherein the network is a MPLS network and wherein the plurality of data entries has a table format wherein the rows are virtual private networks, a column includes the network topology type, a set of columns are defined by the CEs and the table entries include the associated PEs.

21. (Previously presented) A system to monitor a backbone network, the system comprising:

a terminal having a display portion;

a data input device to receive input from a user;

a computer system having a memory and a processor, the computer system coupled to the terminal and to the data input device;

wherein the display portion of the terminal provides an input screen having a data format configured to prompt the user to provide high-level network topology data via the data input device, the backbone network including a plurality of CEs, a plurality of PEs, a plurality of virtual routing and forwarding components, a plurality of route targets, and a plurality of virtual private networks and wherein the high level network topology data identifies the CEs, the PEs within each of the virtual private networks;

wherein the computer system includes a set of rules to convert the high-level network topology data into a set of route targets to be assigned to virtual routing and forwarding (VRF) elements, the set of route targets stored in the memory; and

wherein the memory further includes a VRF to route target data mapping for each of a plurality of PEs and wherein the CEs with the same RT set on one PE share one VRF.

22. (Original) The system of claim 21, wherein the set of rules includes a first set of rules to handle route target to VRF mapping based on a meshed topology and a second set of rules to handle route targets to VRF mapping for a hub and spoke topology and a third set of rules to handle route targets to VRF mapping for a central service topology.

23. (Original) The system of claim 22, wherein the second set of rules includes an import rule and an export rule.

24. (Original) The system of claim 23, wherein the second set of rules applies to two route targets for a particular VRF component.

25. (Original) The system of claim 21, wherein the memory further stores a software program to generate and deploy the set of route targets into a physical network router node.

26. (Canceled).